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scientists in the USSR who are or were engaged in this research. Pertinent comments are included with each of the names listed alphabetically.

- a. Abramov, V S at Kazan State University. One of the "independent" research workers at Kazan. "Independent" means that he handles students without working for A E Arbuzov (see below). Abramov is a good chemist, but definitely (below). He specializes in reactions of sodium diethyl phosphite; must be in his forties or so. He published his first paper in this field in 1940.
- b. Alinov, P E at Kazan State University. One of A E Arbuzov's recent students. First paper in 1951. Young man.
- c. Arbuzov, A E /Aleksander Yermingel'dovich Arbuzov/ at Kazan State University. With the recent death of N D Zelinskii /Nikolay Dmitriyevich Zelinskiy/, A E Arbuzov becomes the oldest active chemist in the USSR. He is in his late 70's. Arbuzov began working in the field of organophosphorus compounds at the turn of the century and published his first article in this field in 1905. Since then he has spawned the development of the organophosphorus research center at Kazan. His son, P A (see below), and his daughter, I A, have also contributed to this field. The daughter, Irina, first published in 1929. She authored two papers (second in 1930) and her name has been absent since. Presumably, she was married and gave up her chemical career.

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- 2 -

The son, B A, is quite active now in this field (see below). The elder Arbuzov A E, along with Michaelis in Germany, may accurately be described as the founding father of organophosphorus chemical research. A E did a beautiful piece of pioneering work in 1905 and it was an opening wedge into our understanding of these compounds. Since then, he has occupied himself in exploring the reaction he discovered, to the extent that it is not very fundamental research. At the present time October 1953, A E is a good chemist, still training graduate students, but his research is not too imaginative. His work revolves around the reaction of alkylhalides with trialkyl phosphites.

- d. Arbuzov, B A Boris Aleksandrovich Arbuzov at Kazan State University. One of the top-notch investigators at Kazan. Son of A E (see above). He has attempted to correlate chemical activity with physical properties and has, therefore, published on molecular refraction, dipole moments, parachors and spectra of organophosphorus compounds. Published first paper with father in 1929. Is, therefore, in his forties and is a contemporary of Kamai Gil'm Kamay and A I Razumov (see below). He seems to be interested in organo-antimony and organo-titanium esters, as well as in organophosphorus compounds. Seems to get better students to train than does his father. B A is actively turning out good graduates. A N Pudovik, one of his recent students, is the top-notch man in the USSR today-- chemistry-wise in organophosphorus compounds (see below). B A Arbuzov is the second best general chemist in this list (after M I Kabachnik; see below), and the second best chemist in organophosphorus compounds (after A N Pudovik, see below).
- e. Azanovskaya, M M at Kazan State University. One of the younger men working with the Arbuzovs at Kazan. First paper in 1947.
- f. Bastanov, E Sh at Kazan State University. One of the younger men at Kazan working with Kamai Gil'm Kamay (See below). First paper in 1951.
- g. Bogonostseva, N P at Kazan State University. One of the younger men at Kazan with B A Arbuzov. First paper in 1950.
- h. Chadaeva, N A at Kazan State University. One of the younger men at Kazan working with Kamai Gil'm Kamay. First paper in 1950.
- i. Ginsburg, V A at some chemical institute in Moscow. One of the younger men working with A Ya Yakubovich. (see below) First paper in 1947.
- j. Kabachnik, M I Martin Izrailevich Kabachnik at the Institute of Organic Chemistry of the Academy of Sciences, Moscow. Kabachnik is the outstanding general research chemist in this list. He has an amazing knowledge of both organic and physical chemistry and he applies both disciplines well to the study of organophosphorus compounds. He is more amazing in that he works independently of the Kazan school. His first publication in 1945. He was reprimanded for teaching the "bourgeois" theory of resonance to graduate students - seems to be publishing at a somewhat below normal rate at present. He specializes in aminophosphonic acids and the Arbuzov reaction. Kabachnik is an important man, not only from the research angle, but from the pedagogical aspect as well. A very important contributor to this field.
- k. Kamai, G Gil'm Kamay at Kazan State University. One of A E Arbuzov's students. First paper in 1929. Has been active in the field of arsenic-phosphorus compounds. He is a good chemist, publishes quite regularly, but is unimaginative and some of his work has been shown to be unreliable. He carries quite a bit of the research at Kazan, and for this reason he is an important contributor to this field.
- l. Khisamova, Z L at Kazan State University. One of Kamai's younger students. First paper in 1950.

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- 3 -

- m. Kitayev, Yu P at Kazan State University. One of Pudovik's recent students. First paper in 1951.
- n. Kunyants, I L [Ivan Lyudvigovich Kunyants] at a Moscow research institute. Very imaginative research man. Does not publish a great deal in this field, but the two articles which he did author were very interesting. Began studies on the incorporation of F into organophosphorus compounds.
- o. Kukhtin, V at Kazan State University. One of [A I] Razumov's students. First paper in 1951.
- p. Lugovkin, B P at Kazan State University. One of B A Arbuzov's younger students. First paper in 1948. One of the better graduates.
- q. Medved, T Ya [Tat'yana Yakovlevna Medved] at Moscow. One of M I Kabachnik's younger students. First paper in 1951.
- r. Mikhailova, N at Kazan State University. One paper in 1941. Probably dropped chemical career due to marriage.
- s. Pudovik, A N at Kazan State University. One of B A Arbuzov's students. For straight organophosphorus chemistry, [redacted] Pudovik is the outstanding organophosphorus research chemist in the USSR. He is quite imaginative and seems to realize the implications (chemically) of his previous discoveries. He is the only man at Kazan who consistently tries to pull himself out of the rut of only doing Arbuzov reactions. A very good chemist, he will undoubtedly be one of the leaders at the Kazan school. First paper in 1947. He is at present imaginatively exploring the reactions of sodium dialkyl phosphonates.
- t. Parfent'ev, L N [L N Parfent'yev] present whereabouts unknown. Parfent'ev represents an interesting case in organophosphorus research in the USSR. He was one of the few workers in this field whose papers did not emanate from Kazan or Moscow. Parfent'ev was at the University of Uzbekistan; published his first paper in 1939. Two more papers appeared sporadically, thereafter, and nothing seems to be authored by him at present.
- u. Razumov, A I at Kazan State University. One of the old-timers, Razumov first published with A E Arbuzov in 1929. He is a classmate, therefore, of both Kamai [Gil'm Kamay] and B A Arbuzov. Since then his work has been quite erratic both as to brilliance and frequency of publication. He does publish by himself, however. Is a good chemist of the order of [V S] Abramov (see above).
- v. Samoilova, O D at Kazan State University. One of B A Arbuzov's students. First paper in 1951.
- w. Sazanova, N at Kazan State University. One of Kamai's students.
- x. Same for Shepeleva, E S [Ye S Shepeleva]
- y. Same for Shugirova, E I [Ye I Shugirova]
- z. Yakubovich, A Ya [Arkadiy Yakovlevich Yakubovich] at some institute in Moscow. One of the really imaginative people in this research. Yakubovich, however, is only interested in organophosphorus compounds as incidental to his study of organometallic compounds. His interests are wide and varied and he seems to do a good job in each field to which he is attracted.
- aa' Zorostrova, V M at Kazan State University. A student of A E Arbuzov and G Kamai [Gil'm Kamay]. First paper in 1940. Has not published by himself as yet.

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- 4 -

2. The above listing is complete [redacted] of current research authors in the field of organophosphorus chemistry in the USSR.

3. The level of the research is fair. Good research is being turned out by B A Arbuzov, I L Knunyants, A N Pudovik, A Ya Yakubovich and M I Kabachnik. As already indicated [redacted] the outstanding chemists in this list to be:

General Organic ChemistryOrganophosphorus Chemistry

(1) Kabachnik, M I

(1) Pudovik, A N

(2) Arbuzov, B A

(2) Arbuzov, B A

Except for these men, the research is not comparable to research in the US. Most of the work is done at Kazan, but quite interesting aspects of the field are performed at Moscow. These are the only two centers for this type of research.

4. [redacted] there is no trend in the research which is definite. They are just performing good fundamental work in organophosphorus compounds. [redacted] no military implications in their work. Rather surprisingly, their papers carry very few references to the type of chemistry involved in the preparation of the anticholinesterases as exemplified by di-isopropyl ~~diisopropyl~~ phosphate. Only recently [redacted] an article referring to "Parathion", the phosphorus containing insecticide. Perhaps some anticholinesterases are being tested biologically, [redacted]

[redacted] On the other hand, [redacted] B A Arbuzov's group has recently prepared a phosphonic acid derivative of 20-methyl cholanthrene which presumably excites the onset of cancer in test animals at an accelerated rate as compared to the unsubstituted carcinogen.

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